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REMARKS

Claims 1-84 were pending in this application at the time the present Office Action was mailed. Claims 32-45 and 77-84 were withdrawn from consideration on October 8, 2003 in response to a restriction requirement and are hereby cancelled. Claims 1 and 46 have been amended in this response, and new claims 85-96 have been added. Accordingly, claims 1-31, 46-76, and 85-96 are now pending in the application.

The status of the claims in light of the Office Action is as follows:

(A) Claims 1, 4-9, 11-13, 17-20, 46, 47, 50-52, 54-56, 60, and 61 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,721,608 to Taniguchi ("Taniguchi");

(B) Claims 2, 3, 10, 14-16, 48, 49, 53, and 57-59 were objected to as being dependent upon rejected base claims, but were indicated to be allowable if rewritten in independent form to include all of the features of the corresponding base claims and any intervening claims; and

(C) Claims 21-31 and 62-76 were indicated to be allowable.

The undersigned attorney wishes to thank the Examiner for engaging in a telephone interview on January 22, 2004 to discuss the present Office Action. The following remarks summarize and expand upon the matters discussed by the Examiner and the undersigned attorney during the interview.

A. Response to the Section 102 Rejection of Claims 1, 4-9, 11-13, 17-20, 46, 47, 50-52, 54-56, 60, and 61

Claims 1, 4-9, 11-13, 17-20, 46, 47, 50-52, 54-56, 60, and 61 were rejected under 35 U.S.C. § 102(b) as being anticipated by Taniguchi. The standard for an anticipation rejection under Section 102 requires, among other things, that "each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." (MPEP 2131; emphasis added.) The applied reference Taniguchi cannot support a Section 102 rejection of claims 1, 4-9, 11-13, 17-20, 46, 47,

50-52, 54-56, 60, and 61 for at least the reason that this reference fails to teach or suggest each and every element as set forth in the claims.

1. Independent Claim 1 is Directed to a Method for Exposing a Microlithographic Substrate to a Selected Radiation Including, *Inter Alia*, Moving the Microlithographic Substrate Along a Substrate Path Both Generally Parallel and Generally Perpendicular to a Radiation Path In a Manner Correlated With The Motion of a Reticle While the Reticle Moves Along a Reticle Path

Claim 1, as amended, is directed to a method for exposing a radiation-sensitive material of a microlithographic substrate to a selected radiation. Claim 1 includes "directing the radiation along a reticle radiation path segment toward a reticle[,] . . . passing the radiation from the reticle and to the microlithographic substrate along a substrate radiation path . . . [and] moving the reticle along a reticle path generally normal to the reticle radiation path segment." Claim 1 further includes "moving the microlithographic substrate relative to the radiation path along a substrate path . . . [both] generally parallel to and perpendicular to the substrate radiation path . . . in a manner correlated with the motion of the reticle while the reticle moves along a reticle path."

2. Taniguchi is Directed to Methods of Exposing a Microlithographic Substrate to a Selected Radiation While Moving the Substrate and a Reticle With Respect to Each Other

As shown in Figure 1, Taniguchi teaches directing radiation IL from a radiation source 1 along a radiation path IX, through a reticle R, and onto a microlithographic substrate W positioned on a substrate support WST. The reticle R and microlithographic substrate W are moved in opposite directions perpendicular to the radiation path IX to scan the incident radiation across the substrate (Taniguchi at col. 5, lines 32-38). Taniguchi discloses movement in the z-direction (generally parallel to the radiation path IX), apparently to adjust the focus of the radiation beam on the substrate W and account for irregularities in the substrate surface (Taniguchi at col. 6, lines 23-34).

3. Taniguchi Cannot Support a Section 102 Rejection of Independent Claim 1

Claim 1, as amended, includes moving the microlithographic substrate generally parallel to and generally perpendicular to the radiation path in a manner correlated with the motion of the reticle while moving the reticle along the reticle path. At best, Taniguchi only discloses movement parallel to the radiation path to refocus the radiation beam on the microlithographic substrate to account for minor deformities and unevenness on the surface of the substrate. The movement of the substrate in Taniguchi is accordingly completely independent of the movement of the reticle. In contrast, claim 1 includes moving the microlithographic substrate parallel to the radiation path in a manner that is correlated with the movement of the reticle. Accordingly, Taniguchi cannot support a Section 102 rejection of claim 1. Therefore, the rejection of independent claim 1 should be withdrawn.

Claims 4-9, 11-13, and 17-20 depend from base claim 1, as do claims 2, 3, 10, and 14-16. Accordingly, Taniguchi cannot support a Section 102 rejection of these dependent claims for at least the reason that this reference cannot support a Section 102 rejection of base claim 1, and for the additional features of these dependent claims. Therefore, the rejection of claims 4-9, 11-13, and 17-20, and the objection to claims 2, 3, 10, and 14-16 should be withdrawn.

Independent claim 46, as amended, includes features generally similar to claim 1, including "a reticle . . . coupled to at least one actuator to move . . . in a direction generally perpendicular to the radiation path" and a "substrate support being movable along both [a] first [component generally parallel to the radiation path] and [a] second [component generally perpendicular to the radiation path] . . . in a manner correlated with the motion of the reticle while the reticle moves along a reticle path." For at least the reasons discussed above with respect to claim 1, Taniguchi cannot support a Section 102 rejection of claim 46. Accordingly, the rejection of independent claim 46 should be withdrawn.

Claims 47, 50-52, 54-56, 60, and 61 depend from base claim 46, as do claims 48, 49, 53, and 57-59. Accordingly, Taniguchi cannot support a Section 102 rejection of

these dependent claims for at least the reason that this reference cannot support a Section 102 rejection of base claim 46, and for the additional features of these dependent claims. Therefore, the rejection of claims 47, 50-52, 54-56, 60, and 61, and the objection to claims 48, 49, 53, and 57-59 should be withdrawn.

B. Response to the Objection to Claims 2, 3, 10, 14-16, 48, 49, 53, and 57-59

Claims 2, 3, 10, 14-16, 48, 49, 53, and 57-59 were objected to as being dependent upon a rejected base claim, but were indicated to be allowable if rewritten in independent form to include all of the features of the corresponding base claim and any intervening claims. These claims have been rewritten in independent form as new claims 85-96, respectively. Accordingly, claims 85-96 are in condition for allowance.

C. Claims 21-31 and 62-76 Are Allowed

Claims 21-31 and 62-76 were allowed in the present Office Action and have not been amended.

D. Other Matters

As noted on page 2 of this response, the specification has been amended at paragraphs [0029] and [0032] only to correct typographical errors. No new matter has been added by these amendments.

The information disclosure statement (IDS) filed March 29, 2002 was objected to in the present Office Action as failing to comply with 37 CFR 1.98(a)(2) which requires a legible copy of each foreign patent listed on the IDS. More specifically, two references cited in the March 29 IDS were crossed through by the Examiner: (1) Japanese Patent No. 11231234 to Asahi Optical Co. Ltd., and (2) Optics.Org Industry News press release entitled "Micronic and Fraunhofer Develop New Pattern Generators." A legible copy of each reference has been included with this response. Accordingly, applicants respectfully request consideration of these references by the Examiner.

In the above-mentioned IDS, the Examiner did not initial two references cited by the applicants: (1) U.S. Patent Application No. 09/993,053, and (2) U.S. Patent

Application No. 09/945,316. Applicants respectfully request confirmation that these references were in fact considered by the Examiner.

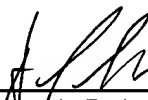
In an IDS filed November 21, 2002, applicants respectfully request confirmation that U.S. Patent No. 6,392,740 to Shiraishi et al. has been considered by the Examiner. The Examiner did not initial this reference.

E. Conclusion

In view of the foregoing, the claims pending in the application comply with the requirements of 35 U.S.C. § 112 and patentably define over the applied art. A Notice of Allowance is, therefore, respectfully requested. If the Examiner has any questions or believes a telephone conference would expedite prosecution of this application, the Examiner is encouraged to call the undersigned at (206) 359-3982.

Respectfully submitted,
Perkins Coie LLP

Date: 2/2/04



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Industry News

Posted: 10 Dec 1999

Micronic and Fraunhofer develop new pattern generators

Micronic Laser Systems, the Swedish manufacturer of extremely accurate laser writers for the production of photomasks, will work with the Fraunhofer Institute for Microelectronic Circuits and Systems of Germany to develop a new breed of pattern generators for future semiconductor products.

The two organizations will collaborate on developing spatial light modulator (SLM) technology, which gives increased writing speed by exposing a million pixels or more in parallel. The SLM system consists of a semiconductor chip with an array of micromirrors, a pulsed excimer laser and a scanning stage. The micromirrors, which work for wavelengths as short as 157 nanometres or less, can be made to reflect or not reflect individually by applying an electric field.

The SLM chip takes the place of the mask and each pixel is imaged as a 0.1 x 0.1 micrometre image element. Each exposure flash prints a projected image of the SLM in the photoresist on the mask blank. Before the next flash, the stage moves to a new position and a new part of the pattern is loaded onto the device. The complete pattern is built up at a rate of 1000 flashes per second.

The micromirror chip will be manufactured in the Fraunhofer silicon laboratory in Dresden, while the rest of the system will be developed by Micronic.

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(54) REFLECTION MIRROR

(57) Abstract:

PROBLEM TO BE SOLVED: To provide a reflection mirror capable of instantaneously switching a shape by using an optical element such as, for example, DMD(a trade name: Digital Micromirror Device), etc.

SOLUTION: A silicon substrate 23 is arranged on a base 22. A yoke 25 is arranged on the silicon substrate 23. The yoke 25 is arranged to be freely turnable with a torsion hinge 26. Micro mirror 21 is arranged on the yoke 25 via a connection pin. In ON state, the yoke 25 and the micro mirror 21 are tilted toward the center side of the reflection mirror 11. The larger the tilt angle is, the further the micro mirror is from the center of the reflection mirror, therefore, the reflection mirror acts as a concave reflection mirror.

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